

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1, 3-7, 9 and 11-12 are currently pending in this application. Claim 2 has been cancelled. No new matter has been added by way of the present amendment. For instance, claim 1 has been amended to incorporate the limitations of previously presented claim 2. Accordingly, no new matter has been added.

In view of the amendments and remarks herein, Applicants respectfully request that the Examiner withdraw all outstanding rejections and allow the currently pending claims.

Interview

Applicants thank the Examiner for the time, helpfulness and courtesies extended to Applicants' representatives during the Interview of May 21 2007. The assistance of the Examiner in advancing prosecution of the present application is greatly appreciated.

In compliance with M.P.E.P. § 713.04, Applicants submit the following remarks.

The Interview Summary form filed on May 21, 2007 amply summarizes the discussions at the Interview. The outstanding rejection of claims 1-9, 11 and 12 as being unpatentable over U.S. 5,847,252 and U.S. 2,135,823 was discussed. Applicants reaffirmed their previous position that the prior art of record fails to teach or suggest every aspect of the present invention. Various ways of addressing the prior art rejection were discussed, and suggestions were discussed that may be drafted to cover particular aspects of the invention as not described by the prior art.

Issues Under 35 U.S.C. § 103(a)

Claims 1-9 and 11-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stine (U.S. 5,847,252) (hereinafter Stine '252) in view of Lyman et al. (U.S. 2,135,823) (hereinafter Lyman '823). Applicants respectfully traverse.

The Examiner asserts that Stine '252 discloses a process for producing a motor fuel component that comprises paraffins by hydrotreating an olefinic stream obtained from a process in which butanes are dimerized, wherein the olefinic stream contains C₈ through C₁₂ hydrocarbons, the hydrotreating is performed by passing the olefinic stream through a series of two reactors, each hydrotreating reactor contains a catalyst such as a noble metal on an alumina support and the reactors contain a fixed bed of catalyst. Furthermore, the Examiner asserts that "it is clear" that these reactors are trickle-bed reactors because "reactants flow downward". The Examiner acknowledges that Stine '252 does not disclose that the feed is in liquid phase, that the feed contains sulfur compounds, or that the catalyst contains specified amounts of metals. Furthermore, the Examiner acknowledges that Stine '252 does not disclose the specific conditions for each reactor. The Examiner relies on the teachings of Lyman '823 to overcome these deficiencies.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Furthermore, there must be a reason why one of ordinary skill in the art would modify the reference or combine reference teachings to obtain the invention. A patent composed of several elements is not proved obvious merely by

demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). There must be a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *Id.* The Supreme Court of the United States has recently held that the "teaching, suggestion, motivation test" is a valid test for obviousness, albeit one which cannot be too rigidly applied. *Id.* Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR Int'l Co. v Teleflex Inc.*

The present invention is directed to a process for the manufacture of paraffinic hydrocarbons, comprising hydrogenating in two steps a mainly olefinic liquid (emphasis added) feedstock comprising 80-97 wt% of C₈ olefins (emphasis added), 3-20 wt% of C₁₂ olefins and 0.1-7wt% of C₉, C₁₀, C₁₁ and olefins heavier than C₁₂. The novel process of the present invention requires the use of a **trickle bed reactor** (emphasis added).

In stark contrast, Stine '252 discloses a process for integrated oligomer production, wherein feeds rich in C₄ paraffins and containing a high percentage of isobutene are utilized (see Stine '252 at column 6, lines 10-27). Stine '252 does not disclose or suggest the use of a trickle bed reactor or a liquid feedstock.

The Example of Stine '252 clearly evidences the differences between the feedstock taught by this reference and the feedstock of the present invention. The Examiner's attention is directed to the Table at column 16, lines 1-33 of Stine '252. Reference number "87" represents the feed to the hydrogenation zone (see also Stine '252 at column 16, lines 55-56). As is clear from the Table, the feed to the hydrogenation zone in Stine '252 contains 60.8% of IC₄ and only

2.3% of C₈. One skilled in the art would readily understand that the feedstock to the hydrogenation zone in Stine '252 is significantly different from the feedstock to the hydrogenation zone of the present invention.

Furthermore, as evidenced by the attached Declaration, the feedstock to the hydrogenation zone in Stine '252 is in the gas phase. There are essential differences between the process disclosed by Stine '252 and the novel process of the present invention. Stine '252 teaches the use of C₇ and lighter components as a feedstock to the saturation/hydrogenation zone. Based on the composition of the feedstock and the disclosed operating conditions of Stine's process (530°F and 485 psi), the feedstock of Stine '252 must inevitably be in the gas phase, as it is over the critical point of the composition.

Additionally, Stine '252 is absolutely silent about the use of trickle-bed reactors. The Examiner asserts that although "[t]he Stine reference does not specifically disclose that the feed is in liquid phase...[i]t would have been obvious...to have modified the process of Stine by utilizing a liquid feed for the hydrogenation process because it would be expected that the results would be the same or similar when using a vapor feed or a liquid feed because the state of the feed before entering the reactor is not important...". Applicants respectfully and strongly disagree. Trickle-bed reactors are three-phase reactors with operating principles that differ significantly from the principles of other reactors. The three-phase reaction necessarily (emphasis added) occurs between gaseous and liquid reactants. The use of liquid feedstock is not merely an option: it is **essential** (emphasis added) to use liquid feedstock in connection with trickle-bed reactors. As discussed above, the feedstock in Stine '252 must necessarily be in the

gas phase. Accordingly, the reactors disclosed by Stine '252 cannot possibly be trickle-bed reactors.

In addition, as acknowledged by the Examiner, Stine '252 fails to disclose the use of a feedstock comprising 1-1000 wt-ppm of sulphur compounds. The Examiner asserts that "by using a sulfur-containing feed, the product would necessarily be desulfurized in the hydrotreating step or Stine" (see outstanding Office Action at page 4, lines 14-15). Applicants respectfully submit that one of ordinary skill in the art would not be motivated to utilize sulphur compounds in the feedstock merely to have an opportunity to remove said compounds at a later stage, as asserted by the Examiner.

Clearly, Stine '252 fails to teach or suggest all the limitations of the present invention. Lyman '823 fails to cure these deficiencies.

Lyman '823 is directed to a process for the production of motor fuels from the polymerization of normally gaseous olefins. Lyman '823 discloses two alternatives for the hydrogenation of the polymer product. When the polymer liquid is low in sulphur, a conventional low-pressure liquid phase process employing a sulphur-sensitive catalyst (nickel) is suitable. However, large quantities of sulphur in the polymer render the catalyst inactive. On the other hand, with higher sulphur contents in the polymer, gas phase hydrogenation is suggested in the presence of a molybdenum-containing catalyst. It is evident that Lyman '823 teaches different processes in the presence of different catalysts. Furthermore, the catalysts are not noble metal catalysts as disclosed in the claims of the present application.

Evidently, the cited references, alone or in combination, fail to teach or suggest every limitation of the instant invention. For this reason alone, this rejection should be withdrawn.

Furthermore, assuming *arguendo* that Lyman '823 cured the deficiencies of Stine '252 (a point which Applicants do not concede), it is noted that references cannot be arbitrarily combined. There must be some reason why one of ordinary skill in the art would be motivated to make the proposed combination of the primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). Courts have clearly established that, even when a combination of references teaches every element of a claimed invention, a rejection based on a *prima facie* case of obviousness is improper absent a motivation to combine. *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

Applicants respectfully submit that one skilled in the art would have not been motivated to modify the teachings of Stine '252 or to combine the teachings of Stine '252 with those of Lyman '823. Furthermore, one skilled in the art would not have been motivated to utilize the specific olefins of the present invention, at specific concentrations, specifically in a trickle-bed reactor at the specific conditions of the present invention, absent hindsight gleaned from Applicants' disclosure.

Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and objections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Andrew D. Meikle, Reg. No. 32,868 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 
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Attachment: Declaration Under 37 C.F.R. 1.132